Return and Repetition: Methods for Material Culture Studies

Smith, K., & Hannan, L. (2017). Return and Repetition: Methods for Material Culture Studies. *Journal of Interdisciplinary History*, *48*(1), 43-59. https://doi.org/10.1162/JINH_a_01088

Published in:
Journal of Interdisciplinary History

Document Version:
Peer reviewed version

Queen's University Belfast - Research Portal:
Link to publication record in Queen's University Belfast Research Portal

ISSUE: XLVIII: 1

RUNNING HEAD RECTO: RETURN AND REPETITION

RUNNING HEAD VERSO: KATE SMITH AND LEONIE HANNAN

SEND PROOFS TO: K.Smith@bham.ac.uk

Return and Repetition: Methods for Material Culture Studies

Studying the material world offers historians an insight into the complex entanglement of relationships

---

Kate Smith is Senior Lecturer in Eighteenth-Century History, University of Birmingham. She is the author of *Material Goods, Moving Hands: Perceiving Production in England, 1700-1830* (Manchester, 2014); "In Her Hands: Materializing Distinction in Georgian Britain," *Cultural and Social History*, XI (2014), 489-506.

Leonie Hannan is Research Fellow, School of History, Anthropology, Politics and Philosophy, Queen's University, Belfast. She is the author of *Women of Letters: Gender, Writing and the Life of the Mind in Early Modern England* (Manchester, 2016); editor of, with Hannah Greig and Jane Hamlett, *Gender and Material Culture in Britain since 1600* (New York, 2015).

The authors thank the Centre for Humanities Interdisciplinary Research Projects (CHIRP) at UCL for funding the 100 Hours project. They also thank the researchers from the "100 Hours" project--Katy Barrett, Tullia Giersberg, Liz Haines, Elin Jones, Juliette Kristensen, Sarah Longair, Emily Orr, Mat Paskins, James Paz, and Florian Roithmayr. In addition, they thank Graham D. Burnett, Ludovic Coupaye, Margot Finn, Chris Laoutaris, Sal Randolph, Catherine Richardson, and Simon Werrett for invaluable contributions, and Joey O'Gorman, Viccy Coltman, and Jane Hamlett for critical readings of this text. This research note is dedicated to the memory of Lisa Jardine, without whose warm support and critical insight the "100 Hours" project would not have been possible.

within which people in the past operated. Things are not, and were not, passive bystanders; they animated the lives of humans and other things. Despite their importance, the methods with which historians approach the material world remain frustratingly static. Yet, as the "new materialism" agenda grows, the need to find new ways of analyzing things increases. This research note asserts that repetition offers a significant method for attending to the material world. It construes repetition as the practice of returning to an object of study multiple times, experiencing it anew with each visit. Rather than re-examination, the term *repetition* deliberately implies multiple, open-ended encounters as opposed to a more limited process of double-checking initial impressions. [1]

Repetition has long been an important tool in such fields of humanities research as literary studies and art history, in which scholars repeatedly return to texts and images to develop critically engaged understandings. Historians also need to adopt repetition as a distinct methodology, particularly in relation to the material world. Repetitive engagement with the material world has the potential to open up new research avenues for historians, through a greater awareness of the questions prompted by things. It also provides a means of developing much-needed material literacies and extending and expanding modes of attention. Based on findings from the "100 Hours" project, which took place at University College London (UCL) in 2013 and 2014, this research note examines the use of repetition by a range of disciplines to suggest ways to broaden and update the technique for future research practice in the field of history.[2]

REPETITION EXPLICATED Deleuze described two kinds of repetition, a "superficial" one predictable by external factors and a "profound" one that can contribute to artistic

creation: “One is negative and by default; the other positive and by excess. One is of elements, extrinsic parts, cases and times; the other is of variable internal totalities, degrees and levels.” Deleuze argues that “laws” and “generalities” can work against creative forms of repetition, sometimes even leading to “transgression,” and that “habit never gives rise to true [artistic] repetition.” He draws together aspects of aesthetics that Immanuel Kant treated separately, namely, theories of art as the form of *possible experience* and of art as the reflection of *real experience*. In doing so, he emphasizes art’s capacity to produce sensation and focuses on the way in which art prompts habits of perception to shift into modes of creation. Deleuze’s suggestion that repetition has the potential to act as a force of either creativity or transgression has been particularly influential in shaping methods of working within the arts.[3]

In humanities research, literary scholars recognize that returning to a text is necessary for interpretation and analysis. For example, in the 1970s, Riffaterre articulated a methodology for handling poetry which saw the first reading of a text as an imitation--an unsatisfactory encounter—requiring a second reading to reveal a text’s significance. For Riffaterre, the first reading of a text takes place within the contained space of the text itself, whereas the re-reading takes place in dialogue with other texts as well. In this way, the process of reading and re-reading generates a dialectic not only between the text and the reader but also between readings. In *On Rereading*, Spacks addressed this same process, suggesting that between each return to a text a scholar’s perspective inevitably shifts and develops. Thus, repeated encounters gradually but ineluctably produce new connections and interpretations in “an experience of repeated unexpected change.” When returning to a text after engaging with other material, literary scholars invariably return to it with new eyes.[4]

Repeated encounters with artworks and applied artworks has also served as an important strategy within art-historical research practice. Recently, for example, Clark, in *The Sight of Death*, recounted his revisiting of two paintings within a six-month period--Nicolas Poussin's "Landscape with a Man Killed by a Snake" (probably 1648) and "Landscape with a Calm" (1650-1651). Although Clark's notes, written as he sat in the gallery at the Getty Institute, were subsequently edited, "the whole record of repetition-compulsion, warts and cosmetics and all," was retained in the final publication. Thus, his book offers scholars both a record and a critical reading of the discipline of repeated looking. Clark also writes about the provisional nature of looking as opposed to the perceived certainties of writing: "Writing automatically aims, or pretends, to be attentive. It likes details.... False vividness gives way abruptly to clever summing up." His contrast between the deceptive directness of writing and the slow, inconclusiveness of looking is important because it indicates how shared expectations regarding the pace of research and its ability to deliver publishable results can structure research practices. Yet, outside of art history and literary studies, the reasons why scholars return to their objects of study, and the revelations that acts of repetition enable, has undergone limited critical attention or recognition.[5]

THE CONTRIBUTION OF THE "100 HOURS" PROJECT This research note draws from concepts developed in the creative arts to challenge historians who wish to engage with objects as primary sources to re-assess their research practices. The insights and reflections discussed herein emerged from the "100 Hours" project, which involved twelve participants from nine different institutions and a range of arts, humanities, and social-science disciplines. The participants individually chose an object from

UCL's diverse museum collections—one that was outside the subject or period in which he or she typically worked--to visit as many times as possible during the course of a year. They also met as a group for five discussions led by guest specialists from anthropology, literary studies, art, and the history of science. The participants prepared for each discussion group by reading a short piece about a particular framework that they could discuss and deconstruct together. After each meeting, the participants applied this approach to their own object, documenting their response on the "100 Hours" website. Their posts, recorded in real time, collectively accounted for "100 hours" of looking, considering, and discussing their chosen objects.[6]

The main intention of the project was to create a space in which the researchers, most of them early in their careers, could convene in a playful and experimental atmosphere to interrogate material things without a predetermined outcome. The leading questions were "What are the assumptions that shape (and perhaps limit) encounters with objects during research? Can repeated acts of attention reveal new methods of analysis and, if so, how? Does writing about encounters with objects change their meaning? Repeated returns to the objects anchored the research and challenged participants to consider what they were doing and thinking about during the process. In addition to broadening research practice, this new space of exploration and open curiosity acted as a foil to academic environments that tend to focus on defined outputs (particularly for scholars early in their careers).

MATERIAL CULTURE AND HISTORY Historians studying early periods of history have consulted archaeological evidence in the form of material culture for decades. More recently, historians of early modern and modern Europe and the Atlantic world have come to value material culture as a primary source for understanding the past, thanks

largely to contributions from anthropology, art history, and science/technology. In 2005, Auslander, in "Beyond Words," argued that "objects not only are the product of history, they are also active agents in history." Moreover, as Auslander (and others) emphasized, "People's relation to language is not the same as their relation to things." Objects offer scholars another form through which to examine human expression. Historians can fully research the many communities in human history that did not articulate their civilizations primarily, or exclusively, through written language only by paying greater attention to these alternative modes of expression. The study of things helps to ensure that no group need be without a history.[7]

The relatively recent publication of numerous readers, survey books, and review articles concerned with the material culture of the early modern and modern eras testifies to a broad recognition that objects loom as important historical resources for these periods. [8] Yet, despite this growing emphasis on object study, few scholars have written about when, where, and how researchers handle and interpret the artifacts that they study. The analysis of objects poses real challenges for historians. In spite of, or maybe because of, this limitation, the *process* of material culture research has resisted significant scrutiny. As Trentmann remarked, "Most [history] scholars have tended to take as given what material culture is and how to study it." Moreover, Trentmann accuses the historical study of material culture of retaining a "remarkably unchanging" research agenda, despite the huge variety of objects, groups, places, and periods that have received attention. An assumption has prevailed that researchers interested in the past can incorporate objects into their repertoire of source material without thoroughly re-examining their methods of encounter.

One of the most significant techniques for analyzing objects, which has had an enduring influence across historical studies (and was crucial to the formation of the

"100 Hours" project), originated in Prown's article, "Mind in Matter: An Introduction to Material Culture Theory and Method." Prown suggested a protocol for object analysis that moved from description to deduction and further investigation. It allows for the examination of both aesthetic and utilitarian facets of a given object. It also stresses the "artistic dimensions of objects … [that] open the way to cultural understanding" and the "shared physiological experience" that researchers can achieve with the makers and the original consumers of artifacts. Although the experiential dimension of working with material culture remains a contested subject for historians, it is highly relevant to the issue of repetition in historical research practice. Implicit within Prown's methodology is the need to return repeatedly and directly to an object to reveal its many layers of meaning. Unlike art historians and literary critics who favor intensive interpretations through repeated encounters with a particular source, historians tend to employ extensive interpretations that involve encounters with many different sources in sequence. Although the needs of historians differ from those of art historians, historians can exploit objects as evidence of nonverbal human experience when they are willing to adopt new ways of greeting, observing, analyzing, and returning to objects.[9]

CULTIVATING CRITICAL INTIMACY AND OBJECT AGENCY Ultimately, this research note, and the "100 Hours" project that preceded it, seeks to prompt scholars undertaking historically oriented research to consider how they can work to expand and deepen their repertoires of object encounter. What happens when scholars in the humanities, but particularly historians, employ repetition in their research? How can historians borrow from, and critically reflect upon, methodologies from other disciplines?

Historians inhabit a professional culture that is typically disconnected from hands-on, materially focused practices. Beyond turning the pages of a manuscript, most historians lack the kind of material literacy that is increasingly becoming a key part of research practice. Recent scholarship highlights the connections between making and imagining. The proliferation of makers' spaces and hacker cultures in contemporary society further reveals the timeliness of material literacy. This new interest in materials and making has begun to make the leap from popular culture to academic concern, as shown by the number of high-profile, university-based "make" spaces that have emerged during the last decade, though such facilities remain the exception rather than the norm. Moreover, a growing interest in material presence, rather than just the semiotic nature of objects, demands changes in methods of research. Rather than continuing to look through objects "to see what they disclose about history, society, nature, or culture--above all what they disclose about *us*," historians are starting to look at things per se and what they do more broadly.[10]

Latour's pioneering book *Reassembling the Social* inaugurated a surge of theoretical work that addresses object agency. This work promotes an object-oriented ontology in which things do not simply exist as adjuncts to humans but as entities in their own right with relationships to other things. It also contends that the new forms of social analysis should not confer special status on anything; everything from sandstone to DVDs and from plumbers to albatrosses deserves to be scrutinized through the same analytical lens. The material world is defined both by material presence, which has the potential to enact change in historical processes, and by systems and encounters. Yet, this theoretical push toward an object-oriented ontology and an appreciation for material presence does not mean that the significance of the objects is self-evident. As historians increasingly engage with the material world as

infrastructure and built environment, they must not fail to encounter, and physically engage seriously with objects. How do we make the material world, on both the small and large scale, legible to our understanding? What does repetition offer this endeavor?[11]

The methodological insights that art historians, literary scholars, and philosophers have brought to repetition need to be understood within a broad context of practice-led research, which emphasizes an iterative or cyclical process. Practice-led, or practice-based, research sees creative artifacts or performance as the basis for a contribution to knowledge. Historians should note, however, that creative-arts scholars have shown that practice-led research evolves through repetition and critical reflection, not through simply acting on a single encounter. Haseman described creative practice as "both ongoing and persistent," suggesting that "practitioner researchers do not merely 'think' their way through or out of a problem, but rather that they 'practice' to a resolution." This intervention echoes earlier calls for the importance of practice and collaboration within the creative arts. In the early 1980s, advocates for "action research" wrote about an "emerging paradigm of co-operative experiential enquiry"--research "*with* and *for* people rather than *on* people." This scholarship provided the foundation for more recent demands that practice-led approaches, involving prolonged open-ended engagements with subjects and sources, be recognized as distinct models for research, with a status equivalent to that of quantitative or qualitative methodologies.[12]

These approaches value "the conditions of participatory and holistic knowing, critical subjectivity and knowledge in action." Advocates insist that they represent a "rupture with traditional research paradigms." Reason's description of "co-operative enquiry" has important implications regarding the importance of repetitive strategies:

"Establishing an aware and self-critical movement between experience and reflection, which goes through several cycles as ideas, practice and experience are systematically honed and refined." Likewise, this analysis of creative practice also resonates with more current thinking about ideal (and often undervalued) working practices. Sennett asserts, "Every good craftsman conducts a dialogue between concrete practices and thinking; this dialogue evolves into sustaining habits, and these habits establish a rhythm between problem solving and problem finding."[13]

Artists and historians have different aims. Artists focus on the expression of human experience and historians on evidence about past human occurrence. Nevertheless, certain features of creative practice can be useful in the study of the past; historical researchers interested in material culture might well look beyond art history, literary studies, anthropology, and archaeology to find new means of investigating the material world. Haseman's concept of "practicing to a resolution" presents a way forward for historical studies of material culture, indicating that returning to an object (or image or text) multiple times is a fruitful strategy for knowledge production. The practice of repetition can begin the important work of marking the different assumptions that researchers bring to their encounters with objects and even generate new insights through a commitment to open-ended research.[14]

Practitioners, however, must do more than simply return. Through repeated encounters they must work to cultivate a "critical intimacy" with objects, developing a broad repertoire of methods to enrich and enliven research practice over time. Blackett makes the same point in his recommendation that experimental physicists hone their skills to "cultivate an intimacy with the physical world." Scholars confronting material culture need to cultivate similar forms of intimacy, beyond mere

reading—that is, close observation and close connection—with the objects of their study. Yet despite the vaunted difficulties entailed in developing what Bennett calls "a perceptual style open to the appearance of thing-power," the benefits of repeated interactions that may well foster new reflections is well worth the effort. The first meeting with a text or an object is an inadequate indicator of future insights; long-held assumptions can result in hasty conclusions. However, a second, third, fourth, or fifth interaction with a given source opens the possibility for alternative perspectives to emerge. By returning, researchers create an opportunity to move in directions that, at first, might not be apparent. At the very least, repetition can enhance critical insight about any assumptions that accompanied a first viewing. Researchers must nurture their ability to maintain critical distance in return engagements by developing new lenses through which to greet objects on each meeting. Many variables are at play—from material changes in an object to shifts in researchers' outlooks or the physical environment. Any one of them can transform an encounter.[15]

The "remarkably unchanging" research agenda within historical material-culture studies has certainly attracted its share of criticism. New, exploratory research practices have the potential to open different avenues of inquiry. But those working in the humanities and social sciences might find such an experiential approach to research too personal (even self-indulgent) and too difficult to generalize. The way to sustain a practice of open-minded and repetitive engagement with the material world is hardly self-evident. To move beyond mere looking to reach understanding and knowledge, while resisting the traps of perceived familiarity, requires a certain discipline. How do we get it, and what kinds of insight does it reveal?[16]

GALTON'S WHISTLE AND WHAT IT MEANS Francis Galton's (1822-1911) research was devoted primarily to human hereditary and biological variation. As such, it was, and still remains, highly controversial. In *Hereditary Genius: An Inquiry into Its Laws and Consequences*, Galton argued that because "man's natural abilities are derived by inheritance," "judicious" breeding could result in the "degradation" or "improvement" of humanity. Although never employed by University College London, Galton became attached to the institution through working closely with Karl Pearson and Flinders Petrie, two of UCL's professors (the connection between them stemmed from a mutual interest in eugenics). One of the objects in Galton's collection that he bequeathed to the university was a whistle (see Figure 1).[17]

Fig. 1 Francis Galton's Whistle, c.1880. © UCL Galton Collection--GALT039, Galton whistles in box H: 30mm, W: 180mm, D: 70mm.

Galton constructed data sets recording measurements of human physiology. By the 1880s, he had established a series of anthropometric laboratories, which

measured and recorded various physiological characteristics, including eye, hair, and skin color; head measurements; arm span; breathing capacity; and hearing. Tabulation of these different characteristics required technological ingenuity. To test hearing, Galton made "five whistles set to emit 10, 20, 30, 40 and 50 thousand vibrations per second respectively." By submitting men and women to these different pitches, Galton concluded, "As in every other faculty," "the male surpasses the female," noting that "18 per cent of the males tested hear the shrillest test notes," whereas only 11 per cent of females could do so.[18]

Alongside this test of human hearing, Galton was also keen to examine how hearing operated in other species, but again he faced problems of technology. After trying "several plans for obtaining acute notes," he finally devised "a very small whistle, whose internal diameter was much less than one-tenth of an inch." Attaching this instrument to one end of a hollow walking stick and an Indian rubber ball to the other end, he took the contraption to the Zoological Gardens to test animal hearing. He ascertained that the animals who pricked their ears when he squeezed the ball could hear the whistle's high frequency. He found that cats and small dogs could also hear these shrill notes, but large dogs could not. Traveling to Bern where "there appear to be more large dogs," Galton was pleased to have his suspicions confirmed. He "tried the whistle for hours together, on a great many large dogs, but could not find one that heard it."[19]

Given the wealth of textual sources, research about Galton's whistle--its politics, purpose, use, accuracy, and reliability--does not depend on first-hand experience with the object itself. But active, repetitive encounters with the whistle can change received understandings and prompt further questions. Objects, apart from the

textual revelations that they are often asked to represent, can present a different horizon that researchers must strive to surpass.

Can researchers really become "intimate" with objects by spending time with them? Handling an object allows us to build a somatic memory of it, but the disruption caused by returning repeatedly to it allows our experience of it to grow. Intimacy is, however, not simply a matter of close observation and knowledge; it entails connection and recognition. Steedman explains that she often establishes important nodal points of intimacy with the historical people that she studies through "the charm of recognition" that occurs when she can link what they wrote to what they did. For Steedman, "It is in action described that we find ourselves in the greatest intimacy with the dead and gone." Reading a note about, say, chopping an onion can spark a recognition that we chop onions in the same way. The same kind of connection explains the potency of material culture--grasping an object and being transported back in history. However, the nature of such experiences is hardly obvious, given that perceptions and sensations are historically and culturally contingent. Nevertheless, "the charm of recognition" remains compelling because of the many researchers who describe it, even if infrequently. In the realm of objects, such moments are often dependent on return.[20]

My third visit to the whistle was the one that proved decisive. Prior to this encounter, the "100 Hours" group had engaged in a session led by Burnett and Randolph, who encouraged participants to attend silently to a collection of 10-pound notes for over twenty minutes. The idea was to question the quality of attention usually directed toward the material world. Returning to the whistle a third time with this lesson in mind, I was more self-conscious in how I attended to it. I handled it again and took my time to look carefully, but I also briefly paused. I began to get

suspicious of its apparent self-evidence and wondered whether it could be considered a single object at all. Later, after further research into other objects, the whistle began to seem more like a set of objects, and an incomplete one at that, to the point that if these individual pieces were to be assembled, they would not even comprise a complete "whistle." [21]

Spending time with the set of objects under analysis cultivated a greater material literacy as well as important rituals of attention and connection. Intimacy with objects creates a more vivid sense of the material world and its historical significance, but it also creates a certain tension. Recognising and grappling with the absences within the assemblage of things represented by the incomplete whistle raised important issues about the whistle's "authenticity" and "credibility" as an historical artifact within the Galton collection. The materiality of the whistle, what was left, failed to match the story that the whistle was supposed to tell about Galton's highly controversial scientific practice. Instead, the materials used to make this piece of equipment, their absence in certain cases, and the signs of wear on them led to questions about the contingent nature of expertise and authority, scientific cultures of construction, their reliance on repair, and the prominence of failure. Close scrutiny led to findings that disrupted any simple relationship between the whistle and the future technologies and procedures that it helped to produce. Instead, the object prompted explorations into histories of materials, nineteenth-century scientific practice, scientific cultures of making and repairing, ideas of use and handling, and the politics of collecting.

In addition to changing understandings of the research project undertaken, encounters with the object for several months also underlined certain methodological insights. Most importantly, they revealed a heretofore unknown complexity. The new

repertoires of attention allowed for "a perceptual style open to the appearance of thing-power" rather than a static self-evidence. Scholars need to bring a range of expectations and techniques to their repeated encounters with object sources if they are to treat them as fluid and complicated entities. Re-construction, re-enactment, and re-contextualization are three strategies that can help in this respect.[22]

RE-CONSTRUCTION, RE-ENACTMENT, AND RE-CONTEXTUALIZATION Objects (like events) can be understood and interpreted only through engagement with "multiple sources of data (texts, objects, quantitative data, lived experience, and hands-on knowledge) acquired in a multi-sensory fashion, firmly grounded in and maintaining a credible link with existing knowledge."[23] Scholars must recognize the nature of their interactions with objects and work to assess how their bodies can learn to engage with objects anew during their research. Scholars have argued that re-construction, as in crafts like furniture making, is a valuable way to understand objects. Such learning confers the kind of material literacy and knowledge about materials that may well permit a better calibration of a maker's original investment in labor. Be that as it may, such first-hand activity cannot cancel the fact that material, embodied knowledge and technique are far from ahistorical phenomena. Nevertheless, experiential engagement can bring benefits that are not driven solely by language. Hands-on study is no more messy, emotional, and subjective than reading is tidy, clean, and objective. It releases different, though still important, meanings and perspectives.[24]

In addition to re-construction, scholars have also turned to re-enactment to comprehend the material cultures and practices of the past. Working with silversmith and conservator Tonny Beentjes, historian of science Pamela H. Smith re-enacted the

series of life-casting processes described in Ms. Fr. 640, a sixteenth-century manuscript containing the detailed instructions of a French metalworker. Historians of science have long benefited from recreating scientific experiments. [25] Smith and Beentjes' project brought greater reality to the labor and skill involved in life casting, the workers' view of the material world, and the look of the original object. Notwithstanding the issues involved in deciphering past activities and materials through present ones, such re-enactments have borne undeniable fruit.

Another means of knowing objects is through re-contextualizing them in multiple ways. The "100 Hours" researchers chose exceptional objects outside the range of the everyday and banal--dodo bones, a ten-legged stool, a plaster cast of a child's foot, and a meteorite--to form an entirely new "collection." These choices shaped the juxtapositions created, the connections made, and the questions asked. By picking these objects and spending time with them, the participants changed them, affecting their appearance within the existing collections and their presence within the setting of a university museum. Previously in the background, the objects were brought together in a new set of relationships; they now came to the foreground, dressed down, dusted off, and tended to.

Every object is a composite of parts as well as part of a larger assemblage. Understanding an object requires placing it in different contexts, putting it in contact with a range of other objects and environments. Re-contextualization is a strategy for becoming more familiar with objects, evoking different understandings and meanings, often (and most productively) as a cooperative effort between scholars.[26]

Re-construction, re-enactment, and re-contextualization demonstrate that the external "sources" consulted to interpret an object are not always texts, objects, or quantitative data. Bodily engagement with objects is another way to acquire

knowledge. Moreover, such encounters are not uniform; they take shape through learning skills (such as furniture making), gaining a broader somatic memory of materials (through engagement with a range of objects), and visiting different environments. A proper acknowledgement of objects highlights not only the importance of reading, description, and analysis but also the cultivation of critical intimacies. Historians need to do more than merely become familiar with objects; they need to establish relationships with them in different situations, investigate how they were made, and even re-construct them when circumstances permit. [27]

This research note argues that repetition can respond to the complexities of analyzing material culture in ways that prompt new and heuristic knowledge. As historians continue to investigate the world, they will increasingly engage with material experience rather than abstract notions of materiality. To respond adequately, and imaginatively, to this "material turn," they must devise new repertoires of literacy. Such repertoires will require that they spend time with the objects of their study, and that they do so repeatedly.

---

[1] For an overview of the "new materialism" agenda, see Diana Coole and Samantha Frost (eds.), *New Materialisms: Ontology, Agency and Politics* (Durham, 2010).

[2] As Steven Shapin and Simon Schaffer have shown, key scientific notions--such as fact and interpretation--are inevitably entangled with the material, social, and political realities of experimental practice. See Shapin and Schaffer, *The Leviathan and the Air Pump: Hobbes, Boyle, and the Experimental Life* (Princeton, 1985).

[3] Gilles Deleuze (trans. Paul Patton), *Difference and Repetition* (New York, 1994; orig. pub. in French as *Différence et Répétition* [Paris, 1968]), 358-359, 1-6. For other influential philosophical treatments of this concept, see Søren Kierkegaard, *Repetition: An Essay in Experimental Psychology* (New York, 1964); Jacques Derrida, "Différance," in *Margins of Philosophy* (Brighton, 1982). Keith Ansell Pearson (ed.), *Deleuze and Philosophy: The Difference Engineer* (London, 1997).

[4] Michael Riffaterre, *Semiotics of Poetry* (Bloomington, 1978), 4-5, 90. Patricia M. Spacks, *On Rereading* (Cambridge, Mass., 2011), 2. Deleuze makes this very point when he describes repetition as a creative force because no repetition is the same as the last (*Difference and Repetition*, 3-6).

[5] Timothy J. Clark, *The Sight of Death: An Experiment in Art Writing* (New Haven, 2006), 9, 4-13. Please note that "Landscape with a Man Killed by a Snake" belongs to the National Gallery, London.

[6] The specialists included anthropologist Ludovic Coupaye (UCL), literary scholars Catherine Richardson (University of Kent) and Chris Laoutaris (University of Birmingham), artist Sal Randolph, and historians of science D. Graham Burnett (Princeton University) and Simon Werrett (UCL).

Burnett and Randolph read from Frank O'Hara, *Meditations in an Emergency* (New York, 1967); Aldous Huxley, *Island* (New York, 1962); William James, *The Principles of Psychology* (London, 1902); Théodule-Armand Ribot, *The Psychology of Attention* (Chicago, 1898); Antony Ward, *Attention: A Neuropsychological Approach* (Hove, 2004); James J. Gibson, *The Ecological Approach to Visual Perception* (London, 2014); John Dewey, *Art as Experience* (New York, 1958); Jeremy H. Prynne, "Resistance and Difficulty," *Prospect*, V (1961), 26-30; David A. R. White, *Attention* (Oxford, 1964); Gregory Sholette, *Dark Matter: Art and politics*

in the Age of Enterprise Culture (London, 2011); Maurice Merleau-Ponty, *The Visible and the Invisible* (Evanston, 1968). Catherine Richardson read from Bruce Smith, *The Acoustic World of Early Modern England: Attending to the O-factor* (Chicago, 1999). Chris Laoutaris read from N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics Literature and Informatics* (Chicago, 1999), 287-91. Werrett read from *idem*, "Recycling in Early Modern Science," *British Journal for the History of Science*, XLVI (2013), 627-646. For the "100 Hours" project, see www.ucl100hours.wordpress.com.

[7] Scholars who investigate, say, Asia, or who focus on indigenous communities in North America or New Zealand, have a long-standing track record of working with material culture. See, for example, Emil Her Many Horses (ed.), *Identity by Design: Tradition, Change, and Celebration in Native Women's Dresses* (New York, 2007). Leora Auslander, "Beyond Words," *American Historical Review*, CX (2005), 1015, 1017, 1018.

[8] For the early modern and modern eras, see, for example, Ian Woodward, *Understanding Material Culture* (London, 2007); Victor Buchli (ed.), *The Material Culture Reader* (New York, 2002); Christopher Tilley et al. (eds.), *Handbook of Material Culture* (London, 2006); Auslander et al. (eds.), "AHR Conversation: Historians and the Study of Material Culture," *American Historical Review*, CXIV (2009), 1354-1404; Frank Trentmann, "Materiality in the Future of History: Things, Practices, and Politics," *Journal of British Studies*, XLVIII (2009), 285; Fiona Candlin, and Raiford Guins (eds.), *The Object Reader* (London, 2009); Chris Caple, *Objects: Reluctant Witnesses to the Past* (London, 2006); Karen Harvey (ed.), *History and Material Culture: A Student's Guide to Approaching Alternative Sources*

(London, 2009); Anne Gerritsen and Giorgio Riello (eds.), *Writing Material Culture History* (New York, 2014).

[9] See, for example, Jules David Prown, "Mind in Matter: An Introduction to Material Culture Theory and Method," *Winterthur Portfolio*, XVII (1982), 15,16. Historical research in general might well benefit from practices of repetition and re-reading.

[10] For making and imagining, see Richard Sennett, *The Craftsman* (London, 2008); Matthew B. Crawford, *The Case for Working with Your Hands: Or Why Office Work Is Bad for Us and Fixing Things Feels Good* (London, 2009). For examples of university-based "make" spaces, see the multidisciplinary Institute of Making at University College London (http://www.instituteofmaking.org.uk/); the Making and Knowing Project at Columbia University, which reconstructs sixteenth-century workshop practices (http://www.makingandknowing.org/). Bill Brown, "Thing Theory," *Critical Inquiry*, XXVIII (2001), 1-22.

[11] Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (New York, 2005); Graham Harman, *Tool-Being: Heidegger and the Metaphysics of Objects* (Chicago, 2002); Ian Bogost, *Alien Phenomenology or What It's Like to Be a Thing* (Minneapolis, 2012); Timothy Morton, *Hyperobjects: Philosophy and Ecology after the End of the World* (Minneapolis, 2013); Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Durham, 2010). For early renditions of the material systems approach, see William Cronon, *Nature's Metropolis: Chicago and the Great West* (New York, 1991); Lynda Nead, *Victorian Babylon: People, Streets and Images in Nineteenth-Century London* (New Haven, 2000); Simon Gunn, *The Public Culture of the Victorian Middle Class: Ritual and Authority and Authority and the English Industrial City, 1840-1914* (Manchester, 2000); Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley, 2002); for more recent examples of

works that include material systems, Trentmann, *Empire of Things: How we Became a World of Consumers, from the Fifteenth Century to the Twenty-First* (London, 2016).

[12] Many different terms have been used to describe practice as a form of research, but *practice-led research* has become the most common. For a fuller discussion, see Henk Borgdorff, "The Debate on Research in the Arts," *Sensuous Knowledge Series*, II (Bergen, 2006), available at www.pol.gu.se/digitalAssets/1322/1322713_the_debate_on_research_in_the_arts.pdf. Brad Haseman, "Rupture and Recognition: Identifying the Performative Research Paradigm," in Estelle Barrett and Barbara Bolt (eds.), *Practice as Research: Approaches to Creative Arts Enquiry* (London, 2007), 147; Peter Reason (ed.), *Human Inquiry in Action: Developments in New Paradigm Research* (London, 1988), 1.

[13] Haseman, "Rupture and Recognition,"156, 155 (Reason quoted); Sennett, *Craftsman*, 9.

[14] Our funding body--the Centre for Humanities Interdisciplinary Research Projects (CHIRP) at UCL--allowed us to embark on a project that was open-ended and focused on method rather than aimed toward a fixed research outcome. For more information about CHIRP, see www.ucl.ac.uk/chirp.

[15] Patrick Blackett, "The Craft of Experimental Physics," in Harold Wright (ed.), *University Studies* (London, 1933), 67-96, as cited by Simon Schaffer at the event "Original or Authentic? The Emergence, Formulation and Realisation of Ideas," February 21, 2014, Central St. Martins, University of the Arts London. Bennett, *Vibrant Matter*, 5.

[16] Trentmann, "Materiality in the Future of History," 285.

[17] Galton, *Hereditary Genius: An Inquiry into Its Laws and Consequences* (London, 1892; orig. pub. 1869), 1.

[18] *Idem, A Descriptive List of Anthropometric Apparatus Consisting of Instruments for Measuring and Testing the Chief Physical Characteristics of the Human Body* (Cambridge, 1889; orig. pub. 1887), 4; *idem, On the Anthropometric Laboratory at the Late International Health Exhibition* (London, 1885), 27.

[19] *Idem, Galton's Whistles for Determining the Upper Limits of Audible Sound in Different Persons* (London, c. 1876), 6; *idem, Inquiries into Human Faculty and Its Development* (London, 1907; orig. pub. 1883), 27-28.

[20] Carolyn Steedman, "Intimacy in Research: Accounting for It," *History of the Human Sciences*, XXI (2008), 22, 27. For perceptions as contingent, see Constance Classen, *The Deepest Sense: A Cultural History of Touch* (Urbana, 2012); David Howes (ed.), *A Cultural History of the Senses in the Modern Age* (London, 2014).

[21] Smith, "Attending to the Object at Hand," available at https://ucl100hours.wordpress.com/attending-to-the-object-at-hand-kate-smith/. For more on the nature of attention, see the works from which specialists took their readings in n. 8.

[22] Bennett, *Vibrant Matter*, 5.

[23]

[24] Auslander et al., "AHR Conversation," 1386, 1379.

[25] Experimental archaeologists have been re-constructing historical structures or technologies for a long time; historians, principally historians of science, began doing so only recently. See Pamela H. Smith, "In the Workshop of History: Making, Writing and Meaning," *West 86th*, XIX (2012), 4-31; Vanessa Agnew, "History's Affective Turn: Historical Reenactment and Its Work in the Present," *Rethinking*

History, XI (2007), 299-312; Ken Albala, "Cooking as Research Methodology: Experiments in Renaissance Cuisine," in Joan Fitzpatrick (ed.), *Renaissance Food from Rabelais to Shakespeare: Culinary Readings and Culinary Histories* (Aldershot, 2010), 73-88; Peter Heering and Roland Wittje (eds.), *Learning by Doing: Experiments and Instruments in History of Science Teaching* (Stuttgart, 2011); Klaus Staubermann, "What Machine Tools Can Tell Us about Historic Skills and Knowledge," *International Journal for the History of Engineering and Technology*, LXXX (2010), 119-132. For the re-creation of scientific experiments, see, for example, Otto Sibum's discussion of "tactile history," available at https://etherwave.wordpress.com/2011/12/17/tacit-knowledge-and-tactile-history-otto-sibum-and-gestural-knowledge/; for a further understanding of the changing nature of water, Chris Otter, "Locating Matter: The Place of Materiality in Urban History," in Tony Bennett and Patrick Joyce (eds.), *Material Powers: Cultural Studies, History and the Material Turn* (New York, 2010), 54.

[26] Arjun Appadurai, "The Thing Itself," *Public Culture*, XVIII (2006), 15-21.

[27] For discussion of embedded and extended cognition (in which objects and environments operate as part of the mind), see Andy Clark and David Chalmers, "The Extended Mind," *Analysis*, LVIII (1998), 7-19.